

12/5/1 (Item 1 from file: 350)

DIALOG(R)File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

014687121 \*\*Image available\*\*

WPI Acc No: 2002-507825/200254

XRPX Acc No: N02-401918

**Temperature control apparatus for electronic system, has turbulence inducing structure arranged along coolant fluid passageway to maintain predetermined temperature along passageway**

Patent Assignee: RAYTHEON CO (RAYT )

Inventor: BRASIER L A ; FLETCHER T C ; MASON J S ; WILSON J S

Number of Countries: 097 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200223966	A2	20020321	WO 2001US28852	A	20010912	200254 B
AU 200190974	A	20020326	AU 200190974	A	20010912	200254

Priority Applications (No Type Date): US 2000660733 A 20000913

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
WO 200223966	A2	E	39 H05K-007/00	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW  
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

AU 200190974. A H05K-007/00 Based on patent WO 200223966

Abstract (Basic): WO 200223966 A2

NOVELTY - A slat assembly (34) made of thermally conductive material such as aluminum silicon carbide (AlSiC) material, has cooling loops arranged to form a fluid passageway. A **turbulence** inducing structure having protrusion extending towards the central axis of passageway, is arranged along the passageway to maintain a predetermined temperature along the passageway when coolant fluid flows through it.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for the temperature maintenance method for thermally conductive plate.

USE - For controlling temperature gradient across components of an electronic system such as monolithic microwave integrated circuit (MMIC) used in a phased array **antenna** system.

ADVANTAGE - Temperature gradients of the components of an electronic system are effectively controlled by using **turbulence** inducing structures, hence thermal expansion and contraction of the slat assembly are prevented.

DESCRIPTION OF DRAWING(S) - The figure shows a perspective view of the temperature control apparatus for an electronic system.

Slat assembly (34)

pp; 39 DwgNo 2/12

Title Terms: TEMPERATURE; CONTROL; APPARATUS; ELECTRONIC; SYSTEM;

TURBULENCE ; INDUCE; STRUCTURE; ARRANGE; COOLANT; FLUID; PASSAGE;

MAINTAIN; PREDETERMINED; TEMPERATURE; PASSAGE

Derwent Class: T06; U11; U14; V04; W02

International Patent Class (Main): H05K-007/00

File Segment: EPI

12/5/2 (Item 2 from file: 350)

DIALOG(R)File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

014074790 \*\*Image available\*\*

WPI Acc No: 2001-559003/200163

XRPX Acc No: N01-415497

**Folded dipole antenna for wireless telecommunication system, has**

radiating section with fed dipole coupled to radiator input section and passive dipole arranged apart from fed dipole  
Patent Assignee: ANDREW CORP (ANDC ); ANDREW AG (ANDC )  
Inventor: WILSON J S ; ZIMMERMAN M L  
Number of Countries: 030 Number of Patents: 006  
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
EP 1098391	A2	20010509	EP 2000123425	A	20001102	200163	B
AU 200069656	A	20010510	AU 200069656	A	20001101	200163	
BR 200005243	A	20010619	BR 20005243	A	20001106	200163	
CN 1298265	A	20010606	CN 2000135531	A	20001103	200163	
US 6285336	B1	20010904	US 99432524	A	19991103	200163	
US 6317099	B1	20011113	US 2000479489	A	20000110	200173	

Priority Applications (No Type Date): US 2000479489 A 20000110; US 99432524 A 19991103

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
EP 1098391	A2	E	20 H01Q-009/26	
			Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR	
AU 200069656	A		H01Q-001/36	
BR 200005243	A		H01Q-009/26	
CN 1298265	A		H04Q-007/30	
US 6285336	B1		H01Q-009/26	
US 6317099	B1		H01Q-009/26	

Abstract (Basic): EP 1098391 A2

NOVELTY - A conductor (14) extending above ground plane (12) has open-ended transmission line stub, radiation input section (40) with integral radiation section (21) and feed section (20). The radiation section has fed dipole (24) coupled to radiator input section and passive dipole (26) which is arranged apart from fed dipole with a gap (29) in between.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for folded dipole antenna fabrication method.

USE - For wireless telecommunication system.

ADVANTAGE - The folded dipole antenna has a conductor that forms few integral radiating section has wide impedance bandwidth. Lowers manufacturing cost as manufacturing time, number of components required for assembly are reduced.

DESCRIPTION OF DRAWING(S) - The figure shows the isometric view of folded dipole antenna .

Ground plane (12)

Conductor (14)

Radiation section (21)

Fed dipole (24)

Passive dipole (26)

Gap (29)

Radiation input section (40)

pp; 20 DwgNo 1a/7

Title Terms: FOLD; DIPOLE; ANTENNA ; WIRELESS; TELECOMMUNICATION; SYSTEM; RADIATE; SECTION; FEED; DIPOLE; COUPLE; RADIATOR; INPUT; SECTION; PASSIVE ; DIPOLE; ARRANGE; APART; FEED; DIPOLE

Derwent Class: W02

International Patent Class (Main): H01Q-001/36; H01Q-009/26; H04Q-007/30

International Patent Class (Additional): H01Q-001/24; H01Q-019/10; H01Q-021/06

File Segment: EPI

12/5/3 (Item 3 from file: 350)

DIALOG(R) File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

013074219 \*\*Image available\*\*

WPI Acc No: 2000-246091/200021

XRPX Acc No: N00-184038

Antenna for radio communication system  
Patent Assignee: ANDREW CORP (ANDC ); ANDREW AG (ANDC )  
Inventor: BIDDLECOM C A; BIDDLECOM P A; DAVIS H W; RACANA L J; ULERY D J;  
WILSON J S ; BISIULES P J; BIBBLECOM C A; RACANA L S  
Number of Countries: 029 Number of Patents: 005  
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 6034649	A	20000307	US 98172329	A	19981014	200021	B
EP 994524	A1	20000419	EP 99120414	A	19991013	200024	
ZA 9906209	A	20000628	ZA 996209	A	19990929	200037	
CN 1254966	A	20000531	CN 99125030	A	19991013	200045	
BR 9904724	A	20000815	BR 994724	A	19991014	200045	

Priority Applications (No Type Date): US 98172329 A 19981014

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 6034649	A	18	H01Q-009/28	
EP 994524	A1 E		H01Q-021/24	
Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI				
ZA 9906209	A	29	H01Q-000/00	
CN 1254966	A		H01Q-021/28	
BR 9904724	A		H01Q-009/28	

Abstract (Basic): US 6034649 A

NOVELTY - Radiating elements (11a-11n) which transmit and receive electromagnetic (EM) signals includes pairs of dipoles (18a,18b-44a,44b). The radiating elements form angles of 45 degrees with respect to the longitudinal axis (13a,13b), respectively. Microstrip hooks are each attached to, and spaced from, each of the respective dipoles by each of the clips.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for an antenna assembling method.

USE - For transmitting and receiving electromagnetic signals in a radio communication system.

ADVANTAGE - Provides antenna array which produces dual polarized signals. Capable of at least 30-decibel port-to-port isolation. Capable of at least 10 decibels cross polarization discrimination at 60 degrees. Obtains high gain while reducing width and height of antenna by staggering the dual polarized radiating elements. Maintains seal integrity over both time and thermal excursions. Allows matching of unbalanced transmission line connected to feed network with the balanced dipole elements. Reduces cost since number of unique components and number of total components is relatively small, adhesive, soldering, and welding are eliminated, and number of mechanical fasteners is minimized.

DESCRIPTION OF DRAWING(S) - The figure shows the perspective view of the top side of an antenna including a mounting plate and staggered radiating elements.

Radiating elements (11a-11n)  
Longitudinal axis (13a,13b)  
Dipoles (18a,18b-44a,44b)  
pp: 18 DwgNo 1/12

Title Terms: ANTENNA ; RADIO; COMMUNICATE; SYSTEM

Derwent Class: W02

International Patent Class (Main): H01Q-000/00; H01Q-009/28; H01Q-021/24;  
H01Q-021/28

File Segment: EPI

12/5/4 (Item 4 from file: 350)

DIALOG(R) File 350:Derwent WPIX  
(c) 2002 Thomson Derwent. All rts. reserv.

012626354 \*\*Image available\*\*

WPI Acc No: 1999-432458/199937

XRPX Acc No: N99-321998

Dual polarization base station antenna for wireless telecommunication

**systems**

Patent Assignee: ANDREW CORP (ANDC ); ANDREW AG (ANDC )

Inventor: IPPOLITO J R; VILLEGRAS H; WILSON J S

Number of Countries: 005 Number of Patents: 005

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
GB 2333400	A	19990721	GB 99664	A	19990114	199937	B
DE 19901179	A1	19990722	DE 1001179	A	19990114	199937	
CN 1231527	A	19991013	CN 99101091	A	19990115	200008	
US 6072439	A	20000606	US 987648	A	19980115	200033	
BR 9900064	A	20000509	BR 9964	A	19990114	200033	

Priority Applications (No Type Date): US 987648 A 19980115

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
GB 2333400	A		33	H01Q-021/00	
DE 19901179	A1			H01Q-021/08	
CN 1231527	A			H01Q-021/24	
US 6072439	A			H01Q-021/26	
BR 9900064	A			H01Q-021/24	

Abstract (Basic): GB 2333400 A

NOVELTY - The **antenna** comprises a backplane (212) having a length, and a vertical axis along the length. Several dipole radiating elements (211a to 211f) project out from a backplane surface, each including a balanced orthogonal pair of dipoles (218,220..228) aligned at first and second predetermined angles relative to the vertical axis, to form crossed dipole pairs. An unbalanced feed network extends along the backplane, and is connected to the elements. There are several printed circuit board baluns, each being attached to an individual dipole.

USE - For transmitting and receiving electromagnetic signals at a base station.

ADVANTAGE - The **antenna** provides at least 30dB of port to port isolation, with matching of the unbalanced transmission line of the feed network to the balanced dipole elements. The arrangement also minimizes the number of **antennas** needed, provides high gain with minimum intermodulation distortion, and has a radome capable of preventing environmental elements from entering the **antenna**.

DESCRIPTION OF DRAWING(S) - The figure shows a perspective view of a top side of a backplane, including six elements and a plate.

Backplane (212)

Dipole radiating elements (211a to 211f)

Orthogonal pairs of dipoles (218,220,222,224,226,228)

pp; 33 DwgNo 9/15

Title Terms: DUAL; BASE; STATION; **ANTENNA** ; WIRELESS; TELECOMMUNICATION; SYSTEM

Derwent Class: W01; W02

International Patent Class (Main): H01Q-021/00; H01Q-021/08; H01Q-021/24; H01Q-021/26

International Patent Class (Additional): H04B-007/10

File Segment: EPI

Set	Items	Description
S1	10	AU='WILSON JAMES S':AU='WILSON JAMES STANLEY'
S2	31	AU='WILSON J S'
S3	8	AU='FLETCHER T C'
S4	2	AU='FLETCHER TIMOTHY C'
S5	3	AU='BRASIER L A':AU='BRASIER LUCIAN A'
S6	17	AU='MASON J S':AU='MASON J S D'
S7	3	AU='MASON JAMES S'
S8	2	AU='MASON JAMES 5 PIKEHOUSE COTTAGES'
S9	67	S1:S8
S10	5	S9 AND (TURBULEN? OR ANTENNA?)
S11	5	IDPAT (sorted in duplicate/non-duplicate order)
S12	4	IDPAT (primary/non-duplicate records only)

?show files

File 347:JAPIO Oct 1976-2002/Jun(Updated 021004)

(c) 2002 JPO & JAPIO

File 348:EUROPEAN PATENTS 1978-2002/Oct W04

(c) 2002 European Patent Office

File 349:PCT FULLTEXT 1979-2002/UB=20021107,UT=20021031

(c) 2002 WIPO/Univentio

File 350:Derwent WPIX 1963-2002/UD,UM &UP=200272

(c) 2002 Thomson Derwent

File 371:French Patents 1961-2002/BOPI 200209

(c) 2002 INPI. All rts. reserv.

• 11/5/1 (Item 1 from file: 350)  
DIALOG(R) File 350:Derwent WPIX  
(c) 2002 Thomson Derwent. All rts. reserv.

014845886 \*\*Image available\*\*  
WPI Acc No: 2002-666592/200271  
Related WPI Acc No: 2002-557006; 2002-565975; 2002-565976; 2002-582582;  
2002-607202; 2002-655946; 2002-665749  
XRPX Acc No: N02-527515

Phased array antenna for use as cellular antenna, estimates desired compensation data based on block of current compensation data and current value of quick control parameter

Patent Assignee: HARRIS CORP (HARO )

Inventor: BLOM D P; TABOR F J; VAIL D K; WILSON S S

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20020105463	A1	20020808	US 2000255007	A	20001212	200271 B
			US 2001990692	A	20011109	

Priority Applications (No Type Date): US 2000255007 P 20001212; US 2001990692 A 20011109

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 20020105463	A1	10	H01Q-003/22	Provisional application	US 2000255007

Abstract (Basic): US 20020105463 A1

NOVELTY - A central controller (14) inputs the current value of a quick control parameter and a block of current compensation data based on the current value of a flow control parameter to the element controllers (13a-13n). The element controller selects a desired compensation data based on the input data to control the antenna elements (12a-12n).

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for element controller operating method in **phased array** antenna.

USE - **Phased array** antenna for use as cellular antenna, airplane and satellite antennas.

ADVANTAGE - A **phased array** antenna with desired compensation data distribution efficiency is achieved for **controlling temperature** and other parameter.

DESCRIPTION OF DRAWING(S) - The figure shows a block diagram of the **phased array** antenna.

antenna elements (12a-12n)  
element controllers (13a-13n)  
central controller (14)

pp; 10 DwgNo 1/4

Title Terms: PHASE; ARRAY; ANTENNA; CELLULAR; ANTENNA; ESTIMATE; COMPENSATE ; DATA; BASED; BLOCK; CURRENT; COMPENSATE; DATA; CURRENT; VALUE; QUICK; CONTROL; PARAMETER

Derwent Class: W02

International Patent Class (Main): H01Q-003/22

File Segment: EPI

11/5/2 (Item 2 from file: 350)

DIALOG(R) File 350:Derwent WPIX  
(c) 2002 Thomson Derwent. All rts. reserv.

014845043 \*\*Image available\*\*  
WPI Acc No: 2002-665749/200271  
Related WPI Acc No: 2002-557006; 2002-565975; 2002-565976; 2002-582582;  
2002-607202; 2002-655946; 2002-666592  
XRPX Acc No: N02-526714

Temperature sensor uses controller to charge capacitor through circuit component such that charging time of capacitor at predetermined threshold is measured to detect predetermined temperature

Patent Assignee: HARRIS CORP (HARO )

Inventor: BLOM D P; TABOR F J; VAIL D K; WILSON S S

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20020094010	A1	20020718	US 2000255007	A	20001212	200271 B
			US 2001991559	A	20011109	

Priority Applications (No Type Date): US 2000255007 P 20001212; US  
2001991559 A 20011109

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 20020094010	A1	14	G01K-007/22	Provisional application US 2000255007

Abstract (Basic): US 20020094010 A1

NOVELTY - The temperature sensor (15) has a circuit component (21) e.g. thermistor, which is connected in series to a capacitor (20) and has a resistance that varies with a predetermined temperature. A module controller (16) performs the charging of the capacitor through the circuit component such that the charging time of the capacitor at a predetermined threshold is measured to determine a temperature.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a temperature detection method.

USE - For e.g. smart antenna system e.g. cellular antenna for ground-based application, airplane or satellite antenna for airborne application.

ADVANTAGE - Provides accurate temperature sensor which can be easily calibrated.

DESCRIPTION OF DRAWING(S) - The figure shows the schematic block diagram of module controller and temperature sensor of phased array antenna module.

Temperature sensor (15)

Module controller (16)

Capacitor (20)

Circuit component (21)

pp; 14 DwgNo 3/6

Title Terms: TEMPERATURE; SENSE; CONTROL; CHARGE; CAPACITOR; THROUGH; CIRCUIT; COMPONENT; CHARGE; TIME; CAPACITOR; PREDETERMINED; THRESHOLD; MEASURE; DETECT; PREDETERMINED; TEMPERATURE

Derwent Class: S03; T01; W02

International Patent Class (Main): G01K-007/22

International Patent Class (Additional): G01K-007/00

File Segment: EPI

11/5/3 (Item 3 from file: 350)

DIALOG(R) File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

014835240 \*\*Image available\*\*

WPI Acc No: 2002-655946/200270

Related WPI Acc No: 2002-557006; 2002-565975; 2002-565976; 2002-582582; 2002-607202; 2002-665749; 2002-666592

XRPX Acc No: N02-518413

Phased array antenna has thermistor that measures temperature of antenna modules, based on time required for charging capacitor to predetermined threshold

Patent Assignee: HARRIS CORP (HARO )

Inventor: BLOM D P; TABOR F J; VAIL D K; WILSON S S

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20020093453	A1	20020718	US 2000255007	A	20001212	200270 B
			US 2001991481	A	20011109	

Priority Applications (No Type Date): US 2000255007 P 20001212; US  
2001991481 A 20011109

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 20020093453	A1	15	H01Q-003/22	Provisional application US 2000255007

Abstract (Basic): US 20020093453 A1

NOVELTY - Each phase array antenna module (11) has a thermistor for determining its temperature, based on charging time required for charging a capacitor to a predetermined threshold.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

- (1) **Phased array** antenna module;
- (2) Temperature sensing method; and
- (3) **Phased array** antenna manufacturing method.

USE - **Phased array** antenna for satellite and cellular communication used for navigation, airplane, etc., with thermistor used for sensing temperature in industries, automobiles, watches, toys, etc.

ADVANTAGE - The temperature of **phased array** antenna modules are sensed accurately. Management of module is reduced.

DESCRIPTION OF DRAWING(S) - The figure shows a block diagram of the **phased array** antenna.

Antenna module (11)

pp; 15 DwgNo 1/6

Title Terms: PHASE; ARRAY; ANTENNA; THERMISTOR; MEASURE; TEMPERATURE; ANTENNA; MODULE; BASED; TIME; REQUIRE; CHARGE; CAPACITOR; PREDETERMINED; THRESHOLD

Derwent Class: S03; U24; W02

International Patent Class (Main): H01Q-003/22

File Segment: EPI

11/5/4 (Item 4 from file: 350)

DIALOG(R) File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

014687121 \*\*Image available\*\*

WPI Acc No: 2002-507825/200254

XRPX Acc No: N02-401918

Temperature control apparatus for electronic system, has turbulence inducing structure arranged along coolant fluid passageway to maintain predetermined temperature along passageway

Patent Assignee: RAYTHEON CO (RAYT )

Inventor: BRASIER L A; FLETCHER T C; MASON J S; WILSON J S

Number of Countries: 097 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200223966	A2	20020321	WO 2001US28852	A	20010912	200254 B
AU 200190974	A	20020326	AU 200190974	A	20010912	200254

Priority Applications (No Type Date): US 2000660733 A 20000913

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
WO 200223966	A2	E	39	H05K-007/00

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW  
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

AU 200190974 A H05K-007/00. Based on patent WO 200223966

Abstract (Basic): WO 200223966 A2

NOVELTY - A slat assembly (34) made of thermally conductive material such as aluminum silicon carbide (AlSiC) material, has cooling loops arranged to form a fluid passageway. A turbulence inducing structure having protrusion extending towards the central axis of passageway, is arranged along the passageway to maintain a predetermined temperature along the passageway when coolant fluid flows through it.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for the temperature maintenance method for thermally conductive plate.

USE - For controlling temperature gradient across components of an electronic system such as monolithic microwave integrated circuit (MMIC) used in a phased array antenna system.

ADVANTAGE - Temperature gradients of the components of an electronic system are effectively controlled by using turbulence inducing structures, hence thermal expansion and contraction of the slat assembly are prevented.

DESCRIPTION OF DRAWING(S) - The figure shows a perspective view of the temperature control apparatus for an electronic system.

Slat assembly (34)

pp; 39 DwgNo 2/12

Title Terms: TEMPERATURE; CONTROL; APPARATUS; ELECTRONIC; SYSTEM; TURBULENCE; INDUCE; STRUCTURE; ARRANGE; COOLANT; FLUID; PASSAGE; MAINTAIN ; PREDETERMINED; TEMPERATURE; PASSAGE

Derwent Class: T06; U11; U14; V04; W02

International Patent Class (Main): H05K-007/00

File Segment: EPI

11/5/5 (Item 5 from file: 350)

DIALOG(R) File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

014050444 \*\*Image available\*\*

WPI Acc No: 2001-534657/200159

XRPX Acc No: N01-396867

Phased array antenna system for satellite, has horizontal and vertical beam forming networks that couple to outputs or orthomode junctions to establish unique phase and amplitude to produce two independent outputs

Patent Assignee: SPACE SYSTEMS/LORAL INC (SPAC-N)

Inventor: BRUNO R D; METZEN P L; SMITH T M

Number of Countries: 028 Number of Patents: 003

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 6201508	B1	20010313	US 99459695	A	19991213	200159 B
JP 2001189618	A	20010710	JP 2000357875	A	20001124	200159
EP 1109252	A2	20010620	EP 2000311143	A	20001213	200159

Priority Applications (No Type Date): US 99459695 A 19991213

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6201508	B1	16		H01Q-021/00	
JP 2001189618	A	12		H01Q-021/06	
EP 1109252	A2	E		H01Q-021/00	

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR

Abstract (Basic): US 6201508 B1

NOVELTY - Vertical and horizontal beam forming networks (14) coupled to orthomode junctions (12) set unique phases and amplitudes to produce separate outputs. A structural panel that couple eight way power divider combiner network to four way power combiner that couples adjacent to phase shifters coupled to output of orthomode junctions by two way power combiner.

DETAILED DESCRIPTION - Orthomode junctions (12) coupled to horn radiating elements (11), produce corresponding vertically and horizontally polarized outputs. An intermediate structural panel that couple two way power combiner divider network to eight way power combiners, to produce respective vertical and horizontal polarized outputs of the antenna system. The radiating elements, orthomode junctions, vertical and horizontal beam forming networks, phase shifters, two way power combiner divider network, four way combiner divider network and eight way power combiner network made of metal plated, injection molded plastics.

USE - For satellites.

ADVANTAGE - The phased array antenna system separates transmit and receive functions into two antennas to reduce transmit

feed system losses and to improve antenna beam shape optimization efficiency. The cost associated with supplying solar array PC power, traveling wave tube amplifier RF power, and thermal control are reduced in satellite system by improving transmit antenna performance.

DESCRIPTION OF DRAWING(S) - The figure shows the perspective view of phased array antenna system.

Horn radiating elements (11)  
Orthomode junctions (12)  
Beam forming network (14)

pp; 16 DwgNo 2/9

Title Terms: PHASE; ARRAY; ANTENNA; SYSTEM; SATELLITE; HORIZONTAL; VERTICAL; BEAM; FORMING; NETWORK; COUPLE; OUTPUT; JUNCTION; ESTABLISH; UNIQUE; PHASE; AMPLITUDE; PRODUCE; TWO; INDEPENDENT; OUTPUT

Derwent Class: W02; W06

International Patent Class (Main): H01Q-021/00; H01Q-021/06

International Patent Class (Additional): H01P-001/18; H01Q-001/28; H01Q-003/26; H01Q-013/00; H01Q-013/02

File Segment: EPI

11/5/6 (Item 6 from file: 350)

DIALOG(R) File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

013956799 \*\*Image available\*\*

WPI Acc No: 2001-441013/200147

Related WPI Acc No: 1999-046087; 2000-303272; 2001-190633

XRAM Acc No: C01-133134

XRPX Acc No: N01-326249

Plasma reactor useful in processing a workpiece contains an inductive antenna and walls defining a chamber

Patent Assignee: APPLIED MATERIALS INC (MATE-N)

Inventor: D'AMBRA A; MOK Y E; REMINGTON R E; SAMMONS J E; YE Y

Number of Countries: 002 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200079564	A2	20001228	WO 2000US40241	A	20000619	200147 B
US 6178920	B1	20010130	US 97869798	A	19970605	200147
			US 98158563	A	19980922	
			US 99336512	A	19990618	

Priority Applications (No Type Date): US 99336512 A 19990618; US 97869798 A 19970605; US 98158563 A 19980922

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 200079564 A2 E 66 H01J-037/00

Designated States (National): JP

US 6178920 B1 C23C-016/00 CIP of application US 97869798  
CIP of application US 98158563  
CIP of patent US 6071372

Abstract (Basic): WO 200079564 A2

NOVELTY - A plasma reactor comprises walls (220) defining a chamber (200), and an inductive antenna. The chamber is adapted to hold a workpiece within for processing with a plasma. The inductive antenna is capable of generating a helicon wave for generating the plasma. The antenna is secured within the walls of the chamber.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a method of processing a workpiece in a plasma reactor, comprising coupling the internal inductive antenna to the chamber wall to transfer the generated heat by the antenna to the wall by conduction, and regulating the temperature of the antenna by regulating the temperature of the chamber wall.

USE - The reactor is useful for processing a workpiece. It is used in etching metals, e.g., copper, platinum, tantalum, rhodium, and titanium.

ADVANTAGE - The use of electrically conductive chamber walls in

combination with internal inductive antenna ensure that the plasma characteristic do not change even when the process results in conductive deposits coating the chamber interior walls. It is easier to form cooling channels in the chamber walls than in the conventional walls. The chamber wall exhibit greater thermal conductivity resulting to a quicker transfer of heat from the antenna and the chamber interior walls to coolant fluid flowing through the cooling channels. It is easier to maintain the narrow chamber temperature range and avoids cracking and flaking off of deposits from the chamber walls. The reactor can be operated in an inductively and/or capacitively coupled mode. It also provides the opportunity to use the reactor to perform a variety of operations over a wide process window.

DESCRIPTION OF DRAWING(S) - The figure shows a partial cut away top view of the plasma reactor.

Chamber (200)

Walls of the chamber (220)

Coil antenna (300)

pp; 66 DwgNo 2A/15

Title Terms: PLASMA; REACTOR; USEFUL; PROCESS; WORKPIECE; CONTAIN; INDUCTIVE; ANTENNA; WALL; DEFINE; CHAMBER

Derwent Class: L03; M14; V05; W02; X14

International Patent Class (Main): C23C-016/00; H01J-037/00

International Patent Class (Additional): H05H-001/00

File Segment: CPI; EPI

11/5/7 (Item 7 from file: 350)

DIALOG(R) File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

013706409 \*\*Image available\*\*

WPI Acc No: 2001-190633/200119

Related WPI Acc No: 1999-046087; 2000-303272; 2001-441013

XRAM Acc No: C01-056944

XRPX Acc No: N01-135449

Plasma reactor for generating a processing plasma has walls defining a processing chamber for holding a workpiece, and small coil antennas arranged in discrete configuration within the chamber

Patent Assignee: APPLIED MATERIALS INC (MATE-N)

Inventor: D'AMBRA A; MOK Y E; REMMINGTON R E; SAMMONS J E; YE Y; REMINGTON R E

Number of Countries: 002 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 6158384	A	20001212	US 97869798	A	19970605	200119 B
			US 98158563	A	19980922	
			US 99336642	A	19990618	
WO 200079568	A2	20001228	WO 2000US16921	A	20000619	200119

Priority Applications (No Type Date): US 99336642 A 19990618; US 97869798 A 19970605; US 98158563 A 19980922

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
US 6158384	A	32	C23C-016/00	CIP of application US 97869798
				CIP of application US 98158563
				CIP of patent US 6071372

WO 200079568 A2 E H01J-037/32

Designated States (National): JP

Abstract (Basic): US 6158384 A

NOVELTY - A plasma reactor comprises walls (210) defining a processing chamber (200) for holding a workpiece, and small coil antennas (100b) secured and arranged within the chamber in a spatially discrete configuration. The antennas generate plasma within the chamber to process the workpiece.

USE - The reactor is used for generating a processing plasma.

ADVANTAGE - The reactor has greater thermal conductivity, and provides quicker transfer of heat from the antenna and the interior

of the chamber to coolant fluid flowing through cool channels formed in the chamber walls, making it easier to maintain a narrow chamber temperature range and avoid the problems of a conventional reactor in connection with the cracking and flaking off of deposits from the chamber walls. The reactor can be operated using any desired mix of inductively and capacitively coupled RF power, providing an opportunity to use the reactor to perform a variety of operations over a wide process window.

DESCRIPTION OF DRAWING(S) - The figure shows a side view of the small internal inductive coil type antenna within a wall of a plasma reactor.

Small coil antennas (100b)  
Pole regions (110b', 110b'')  
Processing chamber (200)  
Walls (210)  
pp; 32 DwgNo 1B/15

Title Terms: PLASMA; REACTOR; GENERATE; PROCESS; PLASMA; WALL; DEFINE; PROCESS; CHAMBER; HOLD; WORKPIECE; COIL; ARRANGE; DISCRETE; CONFIGURATION ; CHAMBER

Derwent Class: M13; V02; V05; W02; X14

International Patent Class (Main): C23C-016/00; H01J-037/32

International Patent Class (Additional): H05H-001/00

File Segment: CPI; EPI

11/5/8 (Item 8 from file: 350)

DIALOG(R) File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

013545583 \*\*Image available\*\*

WPI Acc No: 2001-029789/200104

XRPX Acc No: N01-023798

**Soil temperature control apparatus for soccer field, has phased - array antenna to irradiate electromagnetic waves to partial area of ground and irradiation range is observed by scanner**

Patent Assignee: TAKENAKA KOMUTEN KK (TKEN )

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 2000312552	A	20001114	JP 99122955	A	19990428	200104 B

Priority Applications (No Type Date): JP 99122955 A 19990428

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
JP 2000312552	A	14	A01M-017/00	

Abstract (Basic): JP 2000312552 A

NOVELTY - Grass (20) is grown on the ground (12) of soccer field (10) and sheet like carbon fiber is coated on the ground.

Electromagnetic waves are irradiated to partial area of ground from **phased - array** antenna (26), which is absorbed by the ground. A scanner scans the irradiation range.

USE - Used in soccer field, crops cultivation, garden.

ADVANTAGE - Remote heating of soil is performed reliably by electromagnetic waves.

DESCRIPTION OF DRAWING(S) - The figure shows the schematic block diagram of soccer field.

Soccer field (10)  
• Ground (12)  
Grass (20)  
**Phased - array** antenna (26)  
pp; 14 DwgNo 1/13

Title Terms: SOIL; TEMPERATURE; CONTROL; APPARATUS; SOCCER; FIELD; PHASE; ARRAY; ANTENNA; IRRADIATE; ELECTROMAGNET; WAVE; AREA; GROUND; IRRADIATE; RANGE; OBSERVE; SCAN

Derwent Class: P14; W04; X25

International Patent Class (Main): A01M-017/00

International Patent Class (Additional): A01M-021/00; H05B-006/68;

H05B-006/74; H05B-006  
File Segment: EPI; EngPI

11/5/9 (Item 9 from file: 350)  
DIALOG(R) File 350:Derwent WPIX  
(c) 2002 Thomson Derwent. All rts. reserv.

013114024 \*\*Image available\*\*  
WPI Acc No: 2000-285895/200025  
XRPX Acc No: N00-215336

**Soil temperature control apparatus for soccer field, changes  
irradiation angle of electromagnetic wave from phased array antenna  
for irradiating electromagnetic wave throughout the ground of soccer  
field**

Patent Assignee: TAKENAKA KOMUTEN KK (TKEN )  
Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 2000078931	A	20000321	JP 99123046	A	1999042	200025 B

Priority Applications (No Type Date): JP 98176295 A 19980623

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
JP 2000078931	A	15	A01G-009/24	

Abstract (Basic): JP 2000078931 A

NOVELTY - Irradiation angle of the electromagnetic wave from a phased array antenna (26) is changed for irradiating the electromagnetic wave throughout the ground (12) in soccer field (10). Carbon fiber blended in the ground absorbs the irradiated electromagnetic wave and generates heat due to electromagnetic wave absorption, for heating the ground.

USE - For controlling temperature of soil in soccer field, park, vegetable field.

ADVANTAGE - Enables to heat large area of the soil by performing remote heating operation. Promotes the growth of grass and improves energy utilization efficiency.

DESCRIPTION OF DRAWING(S) - The figure shows the schematic block diagram of the soccer field.

Soccer field (10)  
Ground (12)  
Antenna (26)  
pp; 15 DwgNo 1/12

Title Terms: SOIL; TEMPERATURE; CONTROL; APPARATUS; SOCCER; FIELD; CHANGE; IRRADIATE; ANGLE; ELECTROMAGNET; WAVE; PHASE; ARRAY; ANTENNA; IRRADIATE; ELECTROMAGNET; WAVE; GROUND; SOCCER; FIELD

Derwent Class: P13; P14; T06; X25

International Patent Class (Main): A01G-009/24

International Patent Class (Additional): A01M-017/00; G05D-023/00;  
H05B-006/68; H05B-006/74; H05B-006/80

File Segment: EPI; EngPI

11/5/10 (Item 10 from file: 350)  
DIALOG(R) File 350:Derwent WPIX  
(c) 2002 Thomson Derwent. All rts. reserv.

013040537 \*\*Image available\*\*  
WPI Acc No: 2000-212390/200019  
XRPX Acc No: N00-159186

**Phase control compensation apparatus for active phased array antenna, performs compensation control of phase of control unit corresponding to measured coolant temperature**

Patent Assignee: MITSUBISHI ELECTRIC CORP (MITQ )

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
-----------	------	------	-------------	------	------	------

JP 11340722 A 1999010 JP 98140170 A 19980522 200019 B

Priority Applications (No Type Date): JP 98140170 A 19980521

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes  
JP 11340722 A 14 H01Q-003/30

Abstract (Basic): JP 11340722 A

NOVELTY - A control unit (5) does phase control of a signal transmitted and an input signal to **antenna** element so that the beam can be transmitted along desired direction. A measurement unit (21) **measures temperature** of coolant supplied to cooling plate (18). A compensation unit (8a) performs compensation control of the phase of control unit, corresponding to measured temperature.

USE - For active **phased array** antenna of semiconductor amplifier.

ADVANTAGE - As compensation control of phase is performed corresponding to change in coolant temperature, degradation of capability accompanied by cooling temperature change is prevented.

DESCRIPTION OF DRAWING(S) - The figure shows the block diagram of active **phased array** antenna. (5) Control unit; (8a) Compensation unit; (18) Cooling plate; (21) Measurement unit.

Dwg.1/15

Title Terms: PHASE; CONTROL; COMPENSATE; APPARATUS; ACTIVE; PHASE; ARRAY; ANTENNA; PERFORMANCE; COMPENSATE; CONTROL; PHASE; CONTROL; UNIT; CORRESPOND; MEASURE; COOLANT; TEMPERATURE

Derwent Class: W02

International Patent Class (Main): H01Q-003/30

File Segment: EPI

11/5/11 (Item 11 from file: 350)

DIALOG(R)File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

012887915 \*\*Image available\*\*

WPI Acc No: 2000-059749/200005

XRPX Acc No: N00-046974

Heat release structure for phased array antenna - varies amount of phase control for beam shaping of array surface of phased array antenna, based on heat generation of heat module

Patent Assignee: JAPAN RADIO CO LTD (NIUR )

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 11317618	A	19991116	JP 98136105	A	19980430	200005 B

Priority Applications (No Type Date): JP 98136105 A 19980430

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes  
JP 11317618 A 11 H01Q-021/06

Abstract (Basic): JP 11317618 A

NOVELTY - Based on heat generation of heat module (3) amount of phase control for beam shaping of array surface (2) of **phased array** antenna (1) is varied. A pair of metal plates (4) configured to either sides of the heat module (3) are cooled by a blower (6) coupled to a rotary heat sink (5).

USE - For **phased array** antenna used in radar apparatus, communication system.

ADVANTAGE - Eliminates error of beam spreading angle resulting from asymmetry of **temperature distribution** pattern of the **phased array antenna**. DESCRIPTION OF DRAWING(S) - The figure shows the front elevation of **phased array antenna**. (1) **Phased array antenna**; (2) Array surface; (3) Heat module; (4) Metal plates; (5) Heat sink; (6) Blower.

Dwg.1/11

Title Terms: HEAT; RELEASE; STRUCTURE; PHASE; ARRAY; ANTENNA; VARY; AMOUNT;

· PHASE; CONTROL; BEAM; SHAPE; ARRAY; SURFACE; PHASE; ANTENNA; BASED  
; HEAT; GENERATE; HEAT; MODULE

Derwent Class: W02

International Patent Class (Main): H01Q-021/06

International Patent Class (Additional): H01Q-003/30

File Segment: EPI

11/5/12 (Item 12 from file: 350)

DIALOG(R) File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

012207582 \*\*Image available\*\*

WPI Acc No: 1999-013688/199902

XRPX Acc No: N99-010474

Coolant structure for active phased array radar apparatus - includes coolant supply control unit which adjusts supply of coolant based on output of inflow pressure sensor

Patent Assignee: MITSUBISHI ELECTRIC CORP (MITQ )

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 10282215	A	19981023	JP 9789239	A	19970408	199902 B

Priority Applications (No Type Date): JP 9789239 A 19970408

Patent Details:

Patent No	Kind	Lan Pg	Main IPC	Filing Notes
JP 10282215	A	7	G01S-007/02	

Abstract (Basic): JP 10282215 A

The structure has several active modules (3) arranged in an opening (2) of an antenna (1). A coolant circuit (5) cools the active module by circulating coolant externally. A temperature sensor (9) is provided to measure the temperature of the active module. A temperature abnormality detection unit (10) detects the abnormalities of the temperature sensor.

A inflow pressure sensor (13) measures the inflow pressure of the coolant. A coolant pressure abnormality detector (14) detects the output of the inflow pressure sensor. A coolant supply control unit (15) controls the output of the inflow pressure sensor.

USE - In aircraft.

ADVANTAGE - Protects active module thereby preventing rupture of coolant circuit.

Dwg.1/5

Title Terms: COOLANT; STRUCTURE; ACTIVE; PHASE; ARRAY; RADAR; APPARATUS; COOLANT; SUPPLY; CONTROL; UNIT; ADJUST; SUPPLY; COOLANT; BASED; OUTPUT; INFLOW; PRESSURE; SENSE

Derwent Class: W02; W06

International Patent Class (Main): G01S-007/02

International Patent Class (Additional): G01S-007/03; G01S-007/28;  
H01Q-003/26

File Segment: EPI

11/5/13 (Item 13 from file: 350)

DIALOG(R) File 350:Derwent WPIX

(c) 2002 Thomson Derwent. All rts. reserv.

010803848 \*\*Image available\*\*

WPI Acc No: 1996-300801/199630

Related WPI Acc No: 1996-139849

XRPX Acc No: N96-253021

Atmospheric remote sensing instrument system - has phased array acoustic antenna which receives portions of transmitted electromagnetic energy backscattered by wind in atmosphere

Patent Assignee: RADIANT CORP (RADI-N)

Inventor: PETERMAN K R; SMITH M V

Number of Countries: 017 Number of Patents: 002

•Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 9618916	A1	19960620	WO 95US16130	A	19951213	199630 B
US 5544525	A	19960813	US 94288939	A	19940810	199638
			US 94357723	A	19941216	

Priority Applications (No Type Date): US 94357723 A 19941216; US 94288939 A 19940810

Cited Patents: US 4222265; US 4351188; US 4831874

Patent Details:

Patent No Kind Lan Pg Main IPC Filing Notes

WO 9618916 A1 E 68 G01W-001/02

Designated States (Regional): AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE

US 5544525 A 29 G01W-001/00 CIP of application US 94288939

Abstract (Basic): WO 9618916 A

The system uses a common **phased array** acoustic antenna so as to take temp. and wind measurements over a wide range of altitudes. One of the atmospheric remote sensing instruments in the system is a monostatic sound detection and ranging instrument (SODAR) (32) that takes wind measurements by transmitting pulses of acoustic energy into the atmosphere and then measuring received reflected acoustic energy.

The acoustic pulses are both transmitted and received by the common **phased array** acoustic **antenna** (36). Another of the atmospheric remote sensing instruments in the system is a wind profiling radar (34) that takes wind measurements by transmitting pulses of electromagnetic energy into the atmosphere and then measuring received backscattered electromagnetic energy. A radio acoustic sounding system (RASS) is implemented with the wind profiling radar to **measure temperature profiles**.

ADVANTAGE - Allows temp. and wind profile measurements to be taken over wide range of altitudes. Calculations are simpler.

Dwg. 7/18

Title Terms: ATMOSPHERE; REMOTE; SENSE; INSTRUMENT; SYSTEM; PHASE; ARRAY; ACOUSTIC; ANTENNA; RECEIVE; PORTION; TRANSMIT; ELECTROMAGNET; ENERGY; WIND; ATMOSPHERE

Index Terms/Additional Words: SOUND; DETECTION; AND; RANGING,; ACOUSTIC; SOUNDER

Derwent Class: S03; W06

International Patent Class (Main): G01W-001/00; G01W-001/02

File Segment: EPI

11/5/14 (Item 14 from file: 347)

DIALOG(R) File 347:JAPIO

(c) 2002 JPO & JAPIO. All rts. reserv.

02010404 \*\*Image available\*\*

ACTIVE **PHASED ARRAY** ANTENNA

PUB. NO.: 61-224504 [JP 61224504 A]

PUBLISHED: October 06, 1986 (19861006)

INVENTOR(s): FURUYA TERUO

APPLICANT(s): MITSUBISHI ELECTRIC CORP [000601] (A Japanese Company or Corporation), JP (Japan)

APPL. NO.: 60-064266 [JP 8564266]

FILED: March 28, 1985 (19850328)

INTL CLASS: [4] H01Q-003/26; G01S-007/02

JAPIO CLASS: 44.1 (COMMUNICATION -- Transmission Circuits & Antennae); 44.9 (COMMUNICATION -- Other)

JOURNAL: Section: E, Section No. 484, Vol. 11, No. 65, Pg. 68, February 27, 1987 (19870227)

ABSTRACT

PURPOSE: To prevent deterioration of an antenna pattern due to temperature change of each active module by arranging the inlet and outlet of cooling liquid of a cooling plate in rotation symmetry viewed from the antenna

aperture.

CONSTITUTION: A transmission wave from a feeding section 3 is controlled by a phase shifter 13 in an active module 1, a transmission/reception switch 12 and a high output amplifier 10 and irradiated in a prescribed direction of space via an irradiation section 2. The cooling plate 4 utilizes the cooling liquid flowing the inside to remove the heat generated in the active module 1 so as to keep the wall face of the active module to a prescribed temperature. The inlet 5a and the outlet 5b of the cooling liquid for the cooling plate 4 are arranged in rotation symmetry viewed from the antenna aperture so as to make the **temperature distribution** of the antenna inside in the rotation symmetry, then the wall face of the active module 1 is at a high temperature (at the outlet of the cooling liquid), but the other wall face is at a low temperature (intake of the cooling liquid), the internal temperature of the active module 1 is kept nearly constant, and the deviation of the antenna aperture distribution (amplitude, phase) is a half or below the conventional distribution and the shape is symmetrical.

Set Items Description  
S1 143012 (TEMPERATURE? ? OR THERMAL) (2N) (CONTROL? OR PROFILE? OR DISTRIBUT? OR CONDUCTIV? OR MEASURE OR MEASURES OR MEASUREMENT - OR MEASUREMENTS)  
S2 31147 TURBULEN?  
S3 157433 ANTENNA?  
S4 279 S1(S)S3  
S5 0 S4(S)S2  
S6 37907 VORTEX OR VORTICES OR EDDY OR EDDIES  
S7 2 S6 AND S4  
S8 14 S4 AND PHASED()ARRAY? ?  
S9 16 S8 OR S7  
S10 16 IDPAT (sorted in duplicate/non-duplicate order)  
S11 14 IDPAT (primary/non-duplicate records only)

?show files

File 347:JAPIO Oct 1976-2002/Jun(Updated 021004)

(c) 2002 JPO & JAPIO

File 350:Derwent WPIX 1963-2002/UD,UM &UP=200272

(c) 2002 Thomson Derwent

File 371:French Patents 1961-2002/BOPI 200209

(c) 2002 INPI. All rts. reserv.

Set	Items	Description
S1	4633	ISOTHERMAL
S2	157433	ANTENNA?
S3	2409	PHASED()ARRAY? ?
S4	0	S1(S)S2(S)S3

?show files

File 347:JAPIO Oct 1976-2002/Jun(Updated 021004)  
(c) 2002 JPO & JAPIO

File 350:Derwent WPIX 1963-2002/UD,UM &UP=200272  
(c) 2002 Thomson Derwent

File 371:French Patents 1961-2002/BOPI 200209  
(c) 2002 INPI. All rts. reserv.